

### **Root Cellar Construction**

- Original root cellar initially built in-ground, then covered with concrete roof
  - \_ had a hatch door going down into it
- concrete contractor installing the roof didn't include in quote due to cost (with re-bar: David had to run around the farm to get spare
- Building below ground costs more than building above ground
- BUT vegetables naturally keep better below ground

### **Storage Containers**

- Moved away from storing crops in wooden crates
  - \_ Although you can find good prices on older crates: may run into issues of falling apart due to high moisture levels
- Started using perforated poly bags (25 holes in a bag) but added more (125) with a drill for better storage life
- Stacked bags on top of each other in piles

### **Supplemental Cooling**

- the original root cellar didn't need additional cooling, but with warmer falls recently, has found the need to have a cooling unit to help keep the temperature down and get the crops cool
- some units can take out too much moisture of the air
  - \_ want low differential (fans are not as cold) – low dehydration unit
  - \_ need oxygen exchange – and air movement – has fans mounted in the storage
- run air supply through the length of the room
- for regular in ground cellars you want to have air going out at the top of the ceiling, cold air brought down to the floor
- Would rather get freezing evaporators now . Minus 1 or Minus 2 is fine for storage
  - \_ Potatoes can be kept at lower temperatures if they aren't used for deep frying.
  - \_ otherwise sugar content is raised and they will go black before they are cooked through
- unit is thermostatically controlled to keep a constant temperature

### **Storage Crops**

- Jerusalem Artichoke – Fusau – French type – good for keeping and not a knobby
  - \_ moisture has to be just right – too much and it will mold, too little it will shrivel
- Beets – tried new golden touchstone beets – find they didn't keep as well
  - \_ disease called foma – shows up after they have been in storage – get black on the inside
- Carrots – grows many different colours
  - \_ has been doing niche marketing
  - \_ generally orange ones work the best: choose the varieties suitable for storage
  - \_ look for the best tasting: nantes: blunt-end, has the best flavour and sweetness
  - \_ not commercially done because they are too brittle for machine harvesting
  - \_ can charge a premium since they have to be hand dug
- Onions – Chefs like smaller onions
  - \_ usually grows cippolini, but can get too big by end of season
  - \_ need to crowd them, but not too much to get them smaller

- don't store onions too cold 10C – need steady temperatures, dryer
- put a dehumidifier in the room to keep it warmer and dryer
- if you are heating a room in the shoulder seasons the heater doesn't run enough to make it dry enough
- Leeks
  - will keep in the root cellar well
  - plant in the root cellar floor if you have an earthen floor: leeks will send down roots
    - just need to set down on top of the earth, no digging necessary
    - keeps them alive and healthier longer
    - can also put them in the greenhouse for shorter storage
- Winter Radishes
  - lots of colours (Watermelon Radish with red interior, Black Spanish with black skin, etc)
  - keeps really well all winter long
  - can have a bit of a bite
- Winter Squash
  - can be tricky to cure
  - past season too cool for curing without supplemental heat
  - need 25C + for about 2 weeks to cure (20C at night) should be 30 all the time ideally
  - then into 10C room for storage
  -
- Sweet potatoes
  - taste better uncured, but do not keep well, up to 2 months

Keep humidity as high as possible for cold rooms 90%, and at about 50% for 10C rooms

Q: Do you always cure squash in an open place? Concern of ethylene gas? Told not to store onions and potatoes together:

A: might be an issue: don't store apples in the cold cellar. You will be able to smell ethylene, sweet smelling.

Look in seed catalogues for which ones keep best and which ones taste best: sell the better tasting ones earlier on, and then have the rest for selling later.

Building soil:

Spreading compost with a manure spreader and filling with a loader tractor

Keep track of micro-nutrients: hires a soil consultant since it can be complex

- could have saved money from their help
- put on too much potassium early on, and cost money to put it on
  - makes the vegetables less tasty because the plants take up what is more readily available and not the micro-nutrients that make it taste better and store longer
- too much N in your soil and they won't keep very well
  - California can get away with it since they can produce things constantly

Black rock phosphate

- local in Ontario

Compost teas

- started experimenting recently
- use 50 gallon drum, put in handful on your best compost, and put in bubbler (from home fish tank)
  - needs to be easily cleaned so the things that you don't want in there don't have a chance to grow

Q: how long do you let the compost tea bubble for?

A: used to do it for 3 days; now does 1 day...puts it in loose, then waits an hour to let sediment settle

Used to make their own compost, but 3 years ago a neighbour with a beef operation with a compost maker had surplus of really good compost.

Used compost tea instead of compost on 4 acres, had good results; the biological life gets things going in the soil when applied by compost tea. Would have used

Q: are you adding any supplemental nutrients to the compost tea?

- 1 litre of molasses, 1litre fish emulsion
- What type of molasses? farm grade or black strap
- 

Q: who do you use a seed source?

- William Dam and Johnnys
  - red carrot – scarlet wonder is best, but bolts quickly in ontario
  - might do better in nova scotia where the temperature is more constant

Q: how do you apply compost tea? frequency?

- sprayer, once a year in June, later the better, potatoes in July, other crops in August maybe
- also does foliar spray for potatoes: ran into problems with potatoes plants not dying (no blight)

Q: washed or unwashed storage vegetables?

- leaves the soil on, not too dirty

Q: Is there a carry-over of nutrients when adding compost tea instead of compost?  
just added last year so it is unknown at this point?

- compost tea helped with blight on potatoes

Foliar tests can show what soil tests don't

- can apply at the same time as compost tea: tea acts as a solution to help hold micro-nutrients in place.

Doing a 2 year rotation, 4 year rotation and 3 year, for total of 12 years, 95 acres total, 22 acres in production at a time. 4 acre plots

Oats, peas, and barley as winterkill cover crop

Winter Rye and Hairy Vetch, mow at flowering stage and get almost 100% kill, too early and get regrowth, later and it is too stocky.

Sunflower, Sudan Sorghum, and Peas,

seed after summer weeds have germinated (pigweed and lambsquarter)

- by mid august sunflowers are flower, knock down, cultivate, and seed to rye/vetch mix

Buckwheat

- have enough phosphorus in elemental form, but buckwheat makes it more available
- don't let go to seed (as with sunflowers)

Treat soil gently, use different tools depending on moisture and weeds,

Uses a Spader when you have compaction problems

- breaks up hard pan fairly well...wouldn't always want to go that deep
- bounces over larger rocks

Uses a power harrow for making seed beds (rotates parallel to the soil, and not into the soil)

Uses a straight bar to stale seed bed. drags over the top inch to kill off small weeds

Uses Allis G for weed-cultivation

- important to have the cultivators between the wheels (front to back)

Hill leeks for longer storage

Basket weeder- old cultivation tool works well

Chisel plow used for loosen carrots for pulling

Uses earthway seeder for seeding

- tape up some of the holes: put in fewer seeds in the hopper for better seeding rates
- tip it left or right depending on whether you want less or more

has overhead watering for irrigation

- water the fields for starting seeds
- keep the soil black until 2 or 3pm then it should be alright overnight

Hand seed potatoes since they don't do that much

Digs jerusalem artichokes with potato digger

Covered squash plant with row cover early on

Keep mould of the bottom side (put board underneath)

Has hives to pollinate squash crop

Has a band down the middle of the farm with wildflowers

- want something in flower every week during the summer

- make predatory insects happy
- should be half grass (clumping) and half flower

Checks brix levels in vegetables for storability.

Pest Insects don't have kidneys: if they eat something healthy and high sugars they would explode.  
that's why healthy plants aren't susceptible to pest attacks.

- within 24 hours if you take the right corrective measures you can see brix levels increase
- quick cultivation or deep watering

Jerusalem Artichokes

- give them lots of space, pulling out by hand now.

Wheel hoe

- for cultivation, expensive but worth it.

Q: what would you use for materials if making a cellar now? (Insulated concrete?)

- earth bottom works best: closer affinity to the soil increases shelf life.

Q: apprentices or volunteers on your farm??

- pay people to work
- have trailers for migrant workers, hard to find local help, wonderful workers
- need to pay minimum wage, and eager workers